

Manufacturing Tolerances and Specifications: Drills

Our standard manufacturing specifications are listed herewith. In the event that customer specifications are tighter, then the customer specifications will be adhered to. In general, our manufacturing specifications are equal to or tighter than current ISO or ANSI specifications. Most of our products are special custom built tools, if no industrial standard is available for specific features then Melcut specifications for that feature will be adhered to.

Drill Diameter Tolerances (Inches)

Large Diameter	Tolerances	Minor Diameters	Tolerance
Up to 1/8	+0/- .0005	Up to ... 1/8	+0/- .0010
Over 1/8 up to 1/4	+0/- .0007	Over 1/8 up 1/4	+0/- .0010
Over 1/4 up to 1/2	+0/- .0010	Over 1/4 up to 1/2	+0/- .0015
Over 1/2 up to 1	+0/- .0012	Over 1/2 up to 1	+0/- .0020
Over 1 up to 2	+0/- .0020	Over 1 up to 2	+0/- .0025
Over 2 up to 3 1/2	+0/- .0020	Over 2 up to 3 1/2	+0/- .0030

Overall Length & Flute

Length Tolerances (Inches)

Diameter Range

Up to 1/8	+1/8 / -1/16
Over 1/8 up to 1/2	+1/8 / -1/8
Over 1/2 up to 1	+1/4 / -1/8
Over 1 up to 2	+1/4 / -1/4
Over 2 up to 3 1/2	+3/8 / -3/8

Lip Height Variation (Inches)

Diameter Range

Diameter Range	Total Indicator Variation
Up to ... 1/8	.0020
Over 1/8 up 1/4	.0030
Over 1/4 up to 1/2	.0040
Over 1/2 up to 1	.0050
Over 1 up to 3 1/2	.0060

Point Angle Tolerances

Diameter Range	Angle	Limit
Over 1/16 up to 1/2	118°	+/-5°
Over 1/16 up to 1 1/2	118°	+/-3°
Over 1 1/2 up to 3 1/2	118°	+/-2°

Step Angle Tolerances

Diameter Range	Angle
Over 1/16 up to 1/2	+/-1°
Over 1/16 up to 3 1/2	+/-1/2°

Step Length Tolerances

On multi-diameter tools, each step length will be maintained to within +/- .008"

Back Taper

.0002 to .0005" per inch of flute length on diameter, to a maximum of .004" on diameter regardless of flute length regardless of flute length.

Core Drill Lead Angle Depth

70% of nominal diameter

Drill Straightness

Drill Straightness (or run-out) is a significant element controlling the performance of any cutting tool that rotates. Therefore, straightness / run-out must be rigidly controlled during the manufacturing process. Melcut will maintain standard industrial control limits for all regular length tools. However, as a manufacturer of special cutting tools, many of our products fall outside standard specifications and subject to tool diameter: tool overall length and the tool construction, the control limits will vary. Test procedures and actual limits for individual tools will be made available on request.